

L Number	Hits	Search Text	DB	Time stamp
1	2283	wire and (623/1.\$.ccls. or 623/23.\$.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/02/27 15:39
2	134	(wire and (623/1.\$.ccls. or 623/23.\$.ccls.)) and wire with thread	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/02/27 15:56
3	1487	(606/191,198).CCLS.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/02/27 16:16
4	671	(623/1.2,1.16,1.13,2.38,2.4,2.40,1.20).CCLS	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/02/27 16:18

	Document I	K	Source	Da	Page
1	US 3593342		USP	19710720	6
2	US 3620218		USP	19711116	6
3	US 3663965		USP	19720523	5
4	US 3683926		USP	19720815	5
5	US 3726284		USP	19730410	8
6	US 3745995		USP	19730717	9
7	US 3765032		USP	19731016	6
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29	US 4089071		USP	19780516	11
30	US 4097935		USP	19780704	19
31	US 4108161		USP	19780822	6
32	US 4140126		USP	19790220	4
33	US 4153953		USP	19790515	6
34	US 4163292		USP	19790807	5
35	US 4184922		USP	19800122	7
36	US 4195367		USP	19800401	13
37	US 4214587		USP	19800729	8
38	US 4214322		USP	19800729	13

United States Patent
Hartenbach
[11] 3,833,940
[45] Sept. 10, 1974

[54] BILE DUCT ENDOPROTHESIS
[76] Inventor: Walter Hartenbach, Schwalbacher Str., 62 Wiesbaden, Germany
[22] Filed: Oct. 16, 1972
[21] Appl. No.: 297,746

[30] Foreign Application Priority Data
Nov. 17, 1971 Germany..... 2156954

[52] U.S. Cl. 3/1, 128/334 C, 128/350 R
[51] Int. Cl. A61F 1/24, A61M 27/00
[58] Field of Search 3/1, DIG. 1: 128/334 R, 128/334 C, 348, 349 R, 350 R

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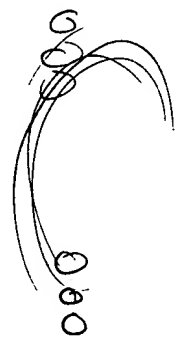
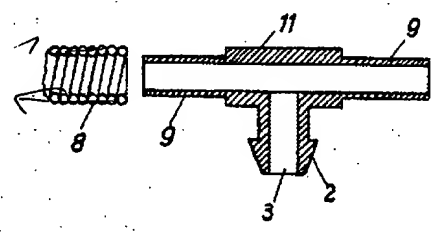
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Primary Examiner—Richard A. Gaudet
Assistant Examiner—Ronald L. Frinks
Attorney, Agent, or Firm—Hauke, Gifford, Patalidis & Dumont

[57] ABSTRACT
A bile duct endoprosthesis having a metal or plastic cannula for introduction into the bile duct and having rounded or beveled ends to aid in insertion and a radially extending portion which serves as a means for attaching a drain hose to the cannula and also as a means for insuring against longitudinal displacement of the cannula after it has been positioned within the bile duct. The cannula has two discrete end sections which are detachable joined to a push on frictional type connector that enables easier implantation of the cannula within a bile duct.

8 Claims, 5 Drawing Figures



	Document	Class	Page
1	US 3593342	USP:19710720	6 P
2	US 3620218	USP:19711116	6 C
3	US 3663965	USP:19720523	5 B
4	US 3683926	USP:19720815	5 TI
5	US 3726284	USP:19730410	8 R
6	US 3745995	USP:19730717	9 A
7	US 3765032	USP:19731016	6 II
8	US 3783868	USP:19740108	11 P
9	US 3826241	USP:19740730	4 II
10	US 3833940	USP:19740910	4 B
11	US 3848578	USP:19741119	4 V
12	US 3852045	USP:19741203	17 V
13	US 3866248	USP:19750218	5 C
14	US 3881199	USP:19750506	6 U
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30	US 4097935	USP:19780704	19 H
31	US 4108161	USP:19780822	6 G
32	US 4140126	USP:19790220	4 M
33	US 4153953	USP:19790515	6 P
34	US 4163292	USP:19790807	5 H
35	US 4184922	USP:19800122	7 D
36	US 4195367	USP:19800401	13 L
37	US 4214587	USP:19800729	8 A
38	US 4214322	USP:19800729	13 L
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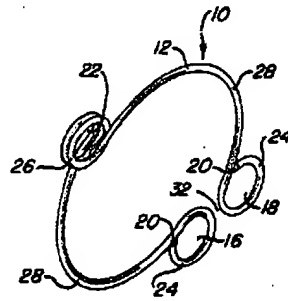


Fig - 1

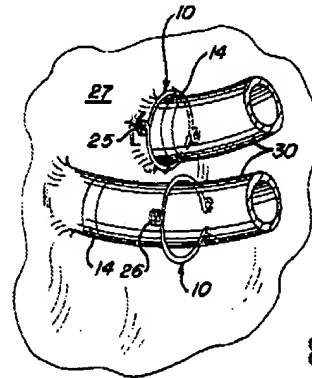


Fig - 4

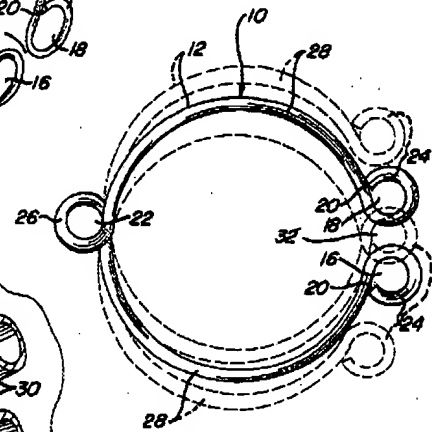


Fig - 2

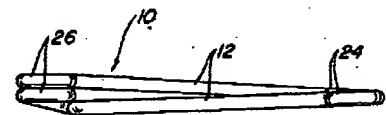


Fig - 3

	Document	Class	Page	
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124	US 4938772	USP:19900703	5	F
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126	US 4950227	USP:19900821	10	S
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128	US 4955911	USP:19900911	5	B
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130	US 4963151	USP:19901016	17	R
131	US 4969904	USP:19901113	5	B
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133	US 4969458	USP:19901113	10	I
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145	US 5019102	USP:19910528	10	A
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148	US 5021063	USP:19910604	6	J
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152	US 5035713	USP:19910730	9	S
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154	US 5037442	USP:19910806	7	F
155	US 5041126	USP:19910820	11	E
156	US 5049157	USP:19910917	7	R
157	US 5059211	USP:19911022	7	A
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159	US 5061275	USP:19911029	12	S
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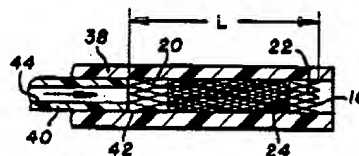


FIG. 2

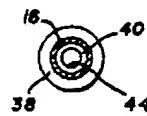


FIG. 3

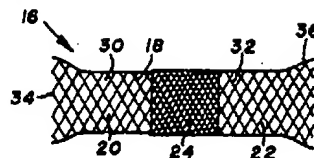


FIG. 1

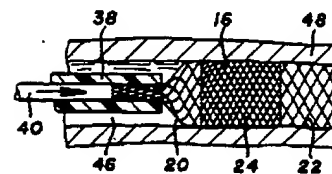


FIG. 4

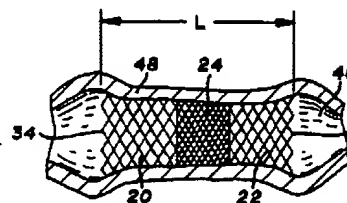


FIG. 5

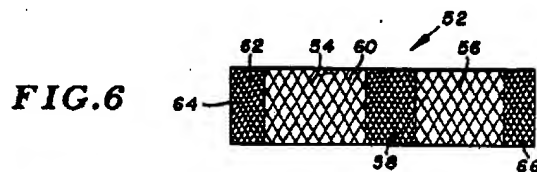


FIG. 6

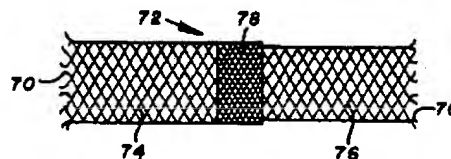


FIG. 7

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306	US 5462781	USP	19951031	20	S
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308	US 5464449	USP	19951107	13	I
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317	US 5484444	USP	19960116	7	D
318	US 5489295	USP	19960206	15	E
319	US 5496372	USP	19960305	54	H
320	US 5500013	USP	19960319	12	B
321	US 5501706	USP	19960326	20	M
322	US 5504300	USP	19960402	10	O
323	US 5503636	USP	19960402	7	S
324	US 5507771	USP	19960416	7	S
325	US 5507767	USP	19960416	9	S
326	US 5509933	USP	19960423	18	M
327	US 5512291	USP	19960430	14	M
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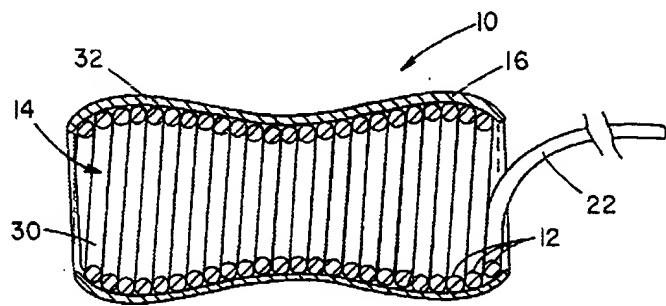


FIG. 4

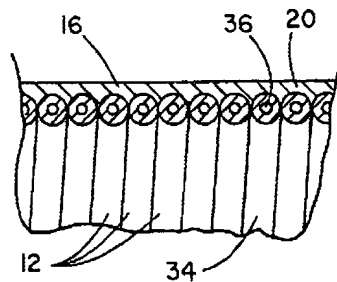


FIG. 5

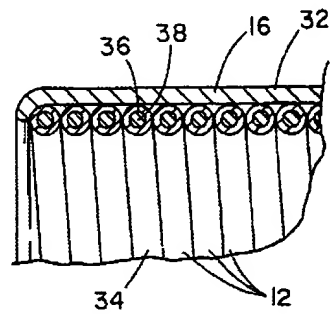


FIG. 6

	Document	US	USP	USP	Page	
209	US 5213580	USP:19930525	10	B		
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211	US 5217483	USP:19930608	5	I		
212	US 5219363	USP:19930615	4	B		
213	US 5226913	USP:19930713	11	M		
214	US 5236447	USP:19930817	15	A		
215	US 5242451	USP:19930907	8	I		
216	US 5246461	USP:19930921	11	F		
217	US 5246445	USP:19930921	13	D		
218	US 5258030	USP:19931102	7	P		
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221	US 5266073	USP:19931130	6	A		
222	US 5269802	USP:19931214	8	P		
223	US 5271736	USP:19931221	8	C		
224	US 5275612	USP:19940104	18	B		
225	US 5279831	USP:19940118	7	H		
226	US 5282861	USP:19940201	11	O		
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230	US 5290305	USP:19940301	31	A		
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242	US RE34632	USP:19940607	8	D		
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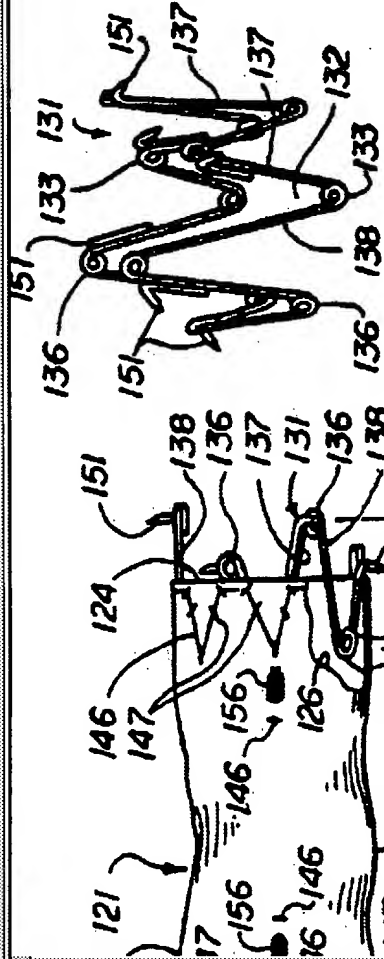


Fig. 10

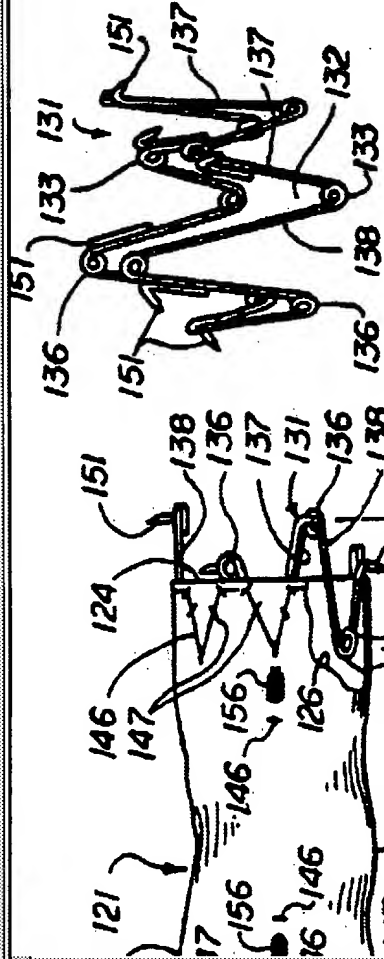


Fig. 11

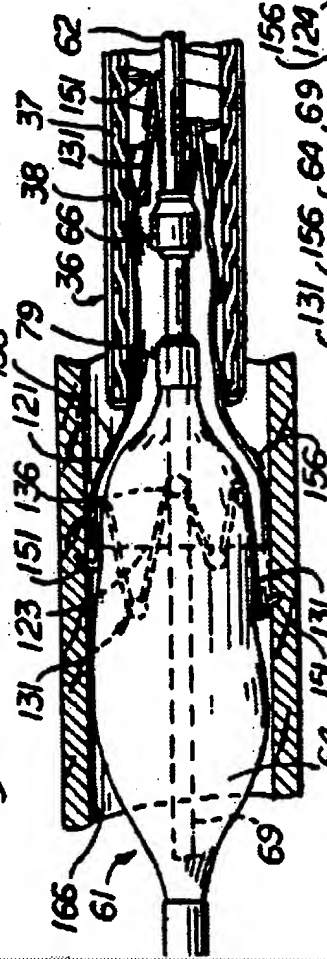


Fig. 12

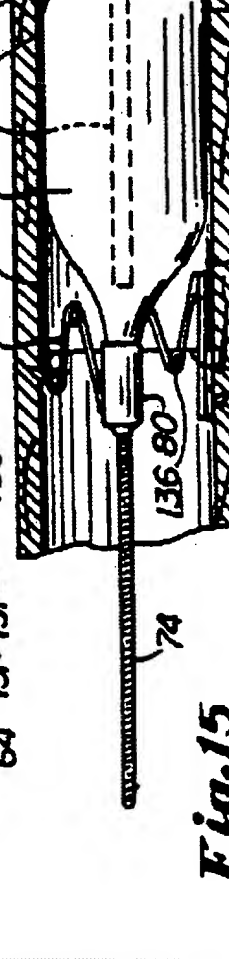


Fig. 15

	Document	Source	Issue	Date	Page	
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4	US 4732152	USP	19880322	10	D	
5	US 4850999	USP	19890725	8	F	
6	US 4875480	USP	19891024	7	D	
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39	US 5873906	USP	19990223	27	P	
40	US 5919225	USP	19990706	26	P	
41	US 5928280	USP	19990727	13	E	
	US 5928279	USP	19990727	14	E	
43	US 5968088	USP	19991019	17	E	

Pat. Nos. 4,655,771 Wallsten; 4,954,126 (Wallsten); and 5,061,275

(Wallsten et al.), the entireties of which are hereby expressly incorporated herein by reference. As shown in the figures of this patent application, this particular stent 14 is composed of rigid but resiliently flexible wires 18. These thread elements or wires 18 are formed of metal, such as an alloy of cobalt, chromium, nickel or molybdenum, wherein the alloying residue is iron.

One specific example of a commercially available alloy which may be usable to

form the wires 18 of the stent 14 is Elgiloy (The Elgiloy Company, 1565 Fleetwood Drive, Elgin, Ill. 60120). The wires 18 of this stent 14 are arranged in helical configuration about a common longitudinal axis LA. A number of the wires 18 are positioned in substantially parallel relation to one

another, but are axially displaced relative to each other. By such arrangement, some of the wires 18 are wound in a first helical direction, while

others are wound in a second or opposite helical direction such that they cross

on opposite sides of adjacent ones of the wires wound in the first helical direction so as to form a helically braided wire stent as shown in the Figures.

This results in the formation of a braided wire stent 14 of generally tubular

configuration which is self-expanding and biased to its radially expanded diameter D.sub.2. However, this stent 14 may be radially compressed to a smaller diameter D.sub.1 and radial constraint, as may be applied by the surrounding wall of the tubular delivery catheter 22 shown in FIG. 1, may be applied to hold the stent 14 in such radially compressed state (diameter D.sub.1). Thereafter, when the radial constraint is removed from the stent

14, the stent 14 will resiliently spring back to its radially expanded diameter D.sub.2. The individual, helically wound wires 18 of this particular braided

stent 14 move and articulate such that the angular dispositions of the wires

18, relative to one another, will change radial expansion and compression of the stent 14. Also, the longitudinal length of the stent 14 will increase as

the stent 14 is radially compressed toward its radially compact configuration

D.sub.1, and such length will shorten as the stent 14 expands toward its radially expanded configuration D.sub.2. Thus, the optional PTFE coating 20 is

applied to the wires 18 of the stent 14, such coating (described in detail herebelow) is preferably flexible enough to withstand the flexing and movement

of the individual wires 18 without cracking or degrading.